

Drawing Amendments

The attached drawing sheets include changes to Figure 4A and Figure 4B. These sheets of Figures 4A and 4B replace the original sheets of Figures 4A and 4B, respectively.

Attachments: Two replacement sheets.

REMARKS

Claims 1-20 are pending in the application.

Applicant's responses to the drawing objection and obviousness rejection raised in the Office Action are set forth in the following discussion.

Drawing Objections

The Examiner has objected to Figures 4A, 4B, 5, 7, 8, 10, 11A, and 11B as failing to comply with 37 C.F.R. §1.84(p)(5) because reference characters in the drawings are not mentioned in the description. Concerning Figures 4A and 4B, the Applicant has amended the drawings and specification to further clarify the drawings and specification. Specifically, the Applicant has replaced the characters "Bit current 1," "Bit current 2," "Word current 1," and "Word current 2" of Figure 4A with "Bit current 402," "Bit current 403," "Word current 406," and "Word current 407," respectively. Similarly, the Applicant has replaced the characters "Bit current 1," "Bit current 2," "Word current 1," and "Word current 2," of Figure 4B with "Bit current 411," "Bit current 412," "Word current 420," and "Word current 421," respectively.

Concerning Figures 5, 7, 8, 10, and 11B, the Applicant respectfully traverses the Examiner's objections because in accordance with 37 C.F.R. 1.84(p)(5), "reference characters not mentioned in the description shall not appear in the drawings" and "reference characters mentioned in the description must appear in the drawings." The Examiner's interpretation of 37 C.F.R. 1.84(p)(5) that reference characters in the drawings must be mentioned in the specification simply is incorrect because 37 C.F.R. 1.84(p)(5) specifies that reference characters mentioned in the description – not drawings – must appear in the drawings. Furthermore, descriptions such as "high voltage," "low voltage," etc. disclosed in the specification are not per se reference characters.

Concerning Figure 11A, the Examiner specifically asserts that reference number 1102 described on page 13, lines 11-12 does not appear in the drawings. The Applicant respectfully traverses the Examiner's objection because reference number 1102 is shown on Figure 11A. Accordingly, for the reasons set forth above, the Applicant requests the Examiner to withdraw the drawing objections.

Obviousness Rejection Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. US 6,114,719 to Dill et al. For the reasons explained below, Applicant respectfully asserts that Dill et al. do not raise a *prima facie* case of obviousness against independent claims 1, 8, and 15.

Independent claims 1, 8, and 15 define a magnetic random access memory (MRAM) cell, an MRAM array, and a method for programming an MRAM. Among other features, a magnetic junction tunnel (MTJ) device is defined to have a perpendicular magnetic orientation.


In support of the obviousness rejection, the Examiner alleges that Dill et al. disclose or suggest an MTJ device that has a perpendicular magnetic orientation, as specified in independent claims 1, 8, and 15. Applicant respectfully traverses the Examiner's characterization of Dill et al. relative to independent claims 1, 8, and 15 because the portion of the reference relied upon by the Examiner (Figure 6) does not disclose or suggest an MTJ device that has a perpendicular magnetic orientation. In particular, Dill et al. disclose that "[a]ll of the layers of the MTJ 100 are grown in the presence of a magnetic field applied *parallel* to the surface of the substrate" (column 9, lines 6-8 (emphasis added)). Further, Dill et al. define MTJ memory cells with first and second ferromagnetic layers, where "the first ferromagnetic layer having a magnetization direction that is generally fixed in a plane *parallel* to the substrate surface and the second ferromagnetic layer" (column 18, lines 33-

40). In contrast, independent claims 1, 8, and 15 define an MTJ device that has a *perpendicular* magnetic orientation. As Dill et al. disclose an MTJ device that has a different magnetic orientation, Dill et al. cannot reasonably be considered to disclose or suggest the MTJ device having a perpendicular magnetic orientation, as defined in independent claims 1, 8, and 15.

To establish a *prima facie* case of obviousness, the cited references must disclose or suggest all the claim features. Here, for the reasons set forth above, Dill et al. do not disclose or suggest all the features of the claimed invention. Accordingly, Applicant submits that independent claims 1, 8, and 15 are patentable under 35 U.S.C. §103(a) over Dill et al. Claims 2-7, 9-14, and 16-20, each of which depends from one of independent claims 1, 8, or 15, are likewise patentable under 35 U.S.C. §103(a) over Dill et al. for at least the same reasons set forth above regarding the applicable independent claims.

Conclusion

In view of the foregoing, the Applicant respectfully requests reconsideration and reexamination of claims 1-20, and submits that these claims are in condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 749-6924. If any additional fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. MXICP017).

Respectfully submitted,
MARTINE PENILLA & GENCARELLA, L.L.P.

Michael K. Hsu
Reg. No. 46,782

710 Lakeway Drive, Suite 200
Sunnyvale, California 94085
Telephone: (408) 749-6900
Customer Number 25920